

U.S. Patent Application Serial No. 09/869,680
Reply to Office Action Dated August 24, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions and listing of claims in the application.

Claims 1, 2, 10, 11, and 17 are amended.

Claims 9 and 16 are canceled.

Claims 18-21 are new.

Listing of Claims:

1. (Currently Amended) A linear light source comprising:
 - an insulating substrate;
 - a plurality of light emitting elements arranged in a row on the substrate;
 - a wiring pattern formed on the substrate in electrical connection with the plurality of light emitting elements for dividing the plurality of light emitting elements into a plurality of groups; and
 - a first and a second terminals in conduction with the wiring pattern;wherein the plurality of light emitting elements define a plurality of intervals between adjacent light emitting elements, one of the plurality of intervals being different in length from another of the intervals; and
wherein the substrate also carries image reading elements provided separately from the plurality of light emitting elements.
2. (Currently Amended) The linear light source according to claim 1, wherein weaker light emitting elements that emit less light than brighter light emitting elements are present and the

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interval between weaker light emitting elements is shorter than the interval between brighter light emitting elements.

3. (Original) The linear light source according to claim 1, wherein the wiring pattern forms a plurality of current paths which correspond to the plurality of groups and extend from the first terminal to the second terminal, and wherein the interval defined between the light emitting elements of a group corresponding to a shorter one of the current paths is narrower than the interval defined between the light emitting elements of another group corresponding to a longer one of the current paths.

4. (Original) The linear light source according to claim 1, wherein each of the plurality of groups includes at least two light emitting elements.

5. (Original) The linear light source according to claim 1, wherein the substrate includes a first end and a second end opposite thereto, the row of light emitting elements extending in a direction from the first end toward the second end, the plurality of intervals becoming gradually narrower in said direction.

6. (Original) The linear light source according to claim 1, wherein the substrate includes a first end, a second end opposite thereto, and an intermediate portion located between the first end and the second end, the row of light emitting elements extending from the first end to the second end, the plurality of intervals becoming gradually narrower from the intermediate portion toward the first end and the second end.

7. (Original) The linear light source according to claim 6, wherein the first terminal and the second terminal are disposed at the intermediate portion of the substrate.

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8. (Original) The linear light source according to claim 1, wherein the wiring pattern includes a first and a second wiring portions extending longitudinally of the substrate, the plurality of light emitting elements being arranged between the first wiring portion and the second wiring portion.

9. (Canceled)

10. (Currently Amended) An image reading apparatus comprising:

a case;

a transparent plate supported by the case;

an image forming lens supported by the case; and

a linear light source for illuminating a document to be read, the linear light source including an insulating substrate, a plurality of light emitting elements arranged in a row on the substrate, a wiring pattern formed on the substrate in electrical connection with the plurality of light emitting elements for dividing the light emitting elements into a plurality of groups, and a first and a second terminals in conduction with the wiring pattern;

wherein the plurality of light emitting elements define a plurality of intervals between adjacent light emitting elements, one of the plurality of intervals being different in length from another of the intervals; and

wherein the substrate also carries image reading elements provided separately from the plurality of light emitting elements.

11. (Currently Amended) A linear light source comprising:

an insulating substrate having a first end and a second end opposite thereto;

a plurality of light emitting elements supported on the substrate and arranged in a row extending from the first end to the second end;

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a wiring pattern in electrical connection with the plurality of light emitting elements, the wiring pattern including a first and a second wiring portions extending from the first end to the second end of the substrate; and

a first and a second terminals formed on the substrate;

wherein the first wiring portion includes a connecting end located close to the first end of the substrate, the second wiring portion including a connecting end located close to the second end of the substrate, the connecting end of the first wiring portion being connected to the first terminal, the connecting end of the second wiring portion being connected to the second terminal, whereby the plurality of light emitting elements emit light of substantially equal brightness; and

wherein the substrate also carries image reading elements provided separately from the plurality of light emitting elements.

12. (Original) The linear light source according to claim 11, wherein the plurality of light emitting elements are arranged between the first wiring portion and the second wiring portion and divided into a plurality of groups by the wiring pattern.

13. (Original) The linear light source according to claim 11, wherein the first and the second terminals are arranged closer to the second end than to the first end of the substrate.

14. (Original) The linear light source according to claim 11, wherein the substrate includes an intermediate portion located between the first end and the second end of the substrate, the first terminal and the second terminal being disposed at the intermediate portion.

15. (Original) The linear light source according to claim 11, wherein the plurality of light emitting elements are arranged on the substrate at substantially equal intervals.

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16. (Canceled)

17. (Currently Amended) An image reading apparatus comprising:

a case;

a transparent plate supported by the case;

an image forming lens supported by the case; and

a linear light source for illuminating a document to be read, the linear light source including an insulating substrate having a first end and a second end opposite thereto, a plurality of light emitting elements supported on the substrate and arranged in a row extending from the first end to the second end, a wiring pattern in electrical connection with the plurality of light emitting elements, the wiring pattern including a first and a second wiring portions extending from the first end to the second end of the substrate, and a first and a second terminals formed on the substrate;

wherein the first wiring portion includes a connecting end located close to the first end of the substrate, the second wiring portion including a connecting end located close to the second end of the substrate, the connecting end of the first wiring portion being connected to the first terminal, the connecting end of the second wiring portion being connected to the second terminal so that the plurality of light emitting elements emit light of substantially equal brightness; and
wherein the substrate also carries image reading elements provided separately from the plurality of light emitting elements.

18. (New) A linear light source comprising:

an insulating substrate;

a plurality of light emitting elements arranged in a row on the substrate;

a wiring pattern formed on the substrate in electrical connection with the plurality of light emitting elements for dividing the plurality of light emitting elements into a plurality of groups; and

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a first and a second terminals in conduction with the wiring pattern;
wherein the plurality of light emitting elements define a plurality of intervals between adjacent light emitting elements, one of the plurality of intervals being different in length from another of the intervals;
wherein the wiring pattern forms a plurality of current paths which correspond to the plurality of groups and extend from the first terminal to the second terminal; and
wherein the interval defined between the light emitting elements of a group corresponding to a shorter one of the current paths is narrower than the interval defined between the light emitting elements of another group corresponding to a longer one of the current paths.

19. (New) A linear light source comprising:

an insulating substrate;
a plurality of light emitting elements arranged in a row on the substrate;
a wiring pattern formed on the substrate in electrical connection with the plurality of light emitting elements for dividing the plurality of light emitting elements into a plurality of groups; and
a first and a second terminals in conduction with the wiring pattern;
wherein the plurality of light emitting elements define a plurality of intervals between adjacent light emitting elements, one of the plurality of intervals being different in length from another of the intervals;
wherein the wiring pattern forms a plurality of current paths which correspond to the plurality of groups and extend from the first terminal to the second terminal; and
wherein the substrate includes a first end and a second end opposite thereto, the row of light emitting elements extending in a direction from the first end toward the second end, the plurality of intervals becoming gradually narrower in said direction.

20. (New) A linear light source comprising:

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an insulating substrate;
a plurality of light emitting elements arranged in a row on the substrate;
a wiring pattern formed on the substrate in electrical connection with the plurality of light emitting elements for dividing the plurality of light emitting elements into a plurality of groups; and
a first and a second terminals in conduction with the wiring pattern;
wherein the plurality of light emitting elements define a plurality of intervals between adjacent light emitting elements, one of the plurality of intervals being different in length from another of the intervals;
wherein the wiring pattern forms a plurality of current paths which correspond to the plurality of groups and extend from the first terminal to the second terminal; and
wherein the substrate includes a first end, a second end opposite thereto, and an intermediate portion located between the first end and the second end, the row of light emitting elements extending from the first end to the second end, the plurality of intervals becoming gradually narrower from the intermediate portion toward the first end and the second end.

21. (New) The linear light source according to claim 20, wherein the first terminal and the second terminal are disposed at the intermediate portion of the substrate.